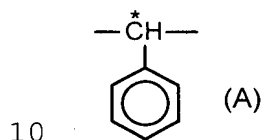


What is claimed is:

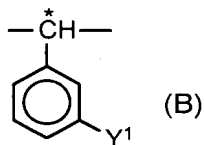
1. A method of increasing a helical twisting power HTP  
(1/μm):

$$5 \quad \text{HTP} = 1/(P \times 0.01C)$$

where C represents an amount (% by weight) of an optically active compound and P represents a natural pitch (μm) in a compound having a partial structure represented by the formula  
(A):



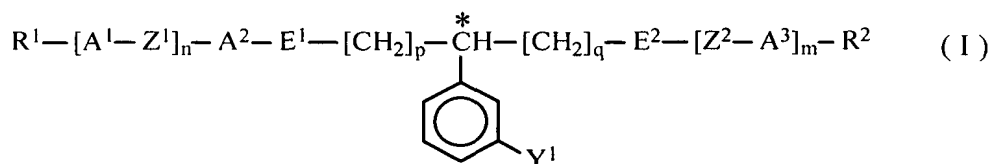
wherein \* represents the position of an asymmetric carbon atom, which has an asymmetric carbon atom, said method comprising replacing a partial structure represented by the above formula (A) by a partial structure represented by the  
15 formula (B):



wherein \* represents the position of an asymmetric carbon atom, and Y<sup>1</sup> represents an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, a  
20 fluorine atom, a chlorine atom, a bromine atom, an iodine atom, a cyano group or an isothiocyanate group, the alkyl group or the alkenyl group is not substituted or can have one,

or two or more fluorine atoms, chlorine atoms, cyano groups, methyl groups or trifluoromethyl groups as a substituent, and one, or two or more methylene groups existing in the alkyl group or the alkenyl group may be substituted with -CO- or may  
 5 be substituted with an oxygen atom or -COO- in such a manner that oxygen atoms are not directly bonded to each other.

2. An optically active compound represented by the general formula (I):



10

wherein \* represents the position of an asymmetric carbon,

$R^1$  and  $R^2$  each independently represents an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, a hydrogen atom, a fluorine atom, a chlorine atom, a bromine atom, an iodine atom, a cyano group or an  
 15 isothiocyanate group, the alkyl group or the alkenyl group is not substituted or can have one, or two or more fluorine atoms, chlorine atoms, cyano groups, methyl groups or trifluoromethyl groups as a substituent, and one, or two or  
 20 more methylene groups existing in the alkyl group or the alkenyl group may be substituted with -CO- or may be substituted with an oxygen atom or -COO- in such a manner that oxygen atoms are not directly bonded to each other,

$A^1$ ,  $A^2$  and  $A^3$  each independently represents a 1,4-phenylene group, a 1,4-cyclohexylene group, a 1,4-cyclohexenyl group, a tetrahydropyran-2,5-diyl group, a 1,3-dioxane-2,5-diyl group, a tetrahydrothiopyran-2,5-diyl group, a 1,4-bicyclo(2,2,2)octylene group, a decahydronaphthalene-2,6-diyl group, a pyridine-2,5-diyl group, a pyrimidine-2,5-diyl group, a pyrazine-2,5-diyl group, a 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, a 2,6-naphthylene group, an indane-2,5-diyl group, a phenanthrene-2,7-diyl group, a 9,10-dihydrophenanthrene-2,7-diyl group, a 1,2,3,4,4a,9,10a-octahydrophenanthrene-2,7-diyl group or a fluorene-2,7-diyl group, and the 1,4-phenylene group, the 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, the 2,6-naphthylene group, phenanthrene-2,7-diyl group, the 9,10-dihydrophenanthrene-2,7-diyl group, the 1,2,3,4,4a,9,10a-octahydrophenanthrene-2,7-diyl group and the fluorene-2,7-diyl group are not substituted or can have one, or two or more fluorine atoms, chlorine atoms, trifluoromethyl groups, trifluoromethoxy groups or methyl groups as a substituent,

$Z^1$  and  $Z^2$  each independently represents a single bond, -CO-, -COO-, -OCO-, -CH=N-, -N=CH-, -C≡C-, -CH<sub>2</sub>CH<sub>2</sub>-, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-, -CH<sub>2</sub>O-, -OCH<sub>2</sub>-, -CF<sub>2</sub>O-, -OCF<sub>2</sub>-, -CH=N-N=CH-, -CF=CF-, -CH=CH-, -CH<sub>2</sub>CH<sub>2</sub>CH=CH-, -CH=CHCH<sub>2</sub>CH<sub>2</sub>- or -CH<sub>2</sub>CH=CHCH<sub>2</sub>-,

$Y^1$  represents an alkyl group having 1 to 10 carbon atoms,

an alkenyl group having 2 to 10 carbon atoms, a fluorine atom, a chlorine atom, a bromine atom, an iodine atom, a cyano group or an isothiocyanate group, the alkyl group or the alkenyl group is not substituted or can have one, two or more fluorine atoms, chlorine atoms, cyano groups, methyl groups or trifluoromethyl groups as a substituent, and one, or two or more methylene groups existing in the alkyl group or the alkenyl group may be substituted with -CO- or may be substituted with an oxygen atom or -COO- in such a manner that oxygen atoms are not directly bonded to each other,

$E^1$  and  $E^2$  each independently represents a single bond, -O-, -CO-, -COO-, -OCO-, -CH<sub>2</sub>-, -CH<sub>2</sub>CH<sub>2</sub>-, -CH<sub>2</sub>O-, -OCH<sub>2</sub>-, -COCH<sub>2</sub>-, -CH<sub>2</sub>CO-, -COOCH<sub>2</sub>-, -OCOCH<sub>2</sub>-, -CH<sub>2</sub>COO- or -CH<sub>2</sub>OCO-,

m, n, p and q each independently represents 0, 1 or 2 and, when n represents 2, the two groups  $A^1$  or the two groups  $Z^2$  may be the same or different, and when m represents 2, the two groups  $Z^2$  or the two groups  $A^3$  may be the same or different, and

any oxygen atom in  $E^2$  and any oxygen atom in  $Z^2$  are not adjacent to each other.

3. The optically active compound according to claim 2, wherein m and q represent 0,  $E^2$  represents a single bond, and  $R^2$  represents a methyl group or a trifluoromethyl group.

4. The optically active compound according to claim 2,  
wherein  $Y^1$  represents an alkyl group having 1 to 3 carbon  
atoms, an alkoxy group having 1 to 3 carbon atoms, an alkenyl  
group having 2 to 3 carbon atoms, an alkenyloxy group having 2  
5 to 3 carbon atoms, a fluorine atom, a chlorine atom or a  
bromine atom, and the alkyl group, the alkenyl group, the  
alkoxy group and the alkenyloxy group are not substituted or  
can one, or two or more fluorine atoms or chlorine atoms as a  
substituent.

10

5. The optically active compound according to claim 4,  
wherein  $m$  and  $q$  represent 0,  $E^2$  represents a single bond, and  
 $R^2$  represents a methyl group or a trifluoromethyl group.

15 6. The optically active compound according to claim 5,  
wherein  $p$  represents 0 and  $E^1$  represents  $-CH_2-$ ,  $-O-$ ,  $-CO-$ ,  
 $-COO-$ ,  $-OCO-$ ,  $-CH_2CH_2-$ ,  $-CH_2O-$ ,  $-OCH_2-$ ,  $-COCH_2-$  or  $-CH_2CO-$ .

7. The optically active compound according to claim 5,  
20 wherein  $p$  represents 0,  $E^1$  represents  $-COO-$ , and  $R^2$  represents  
a methyl group.

8. The optically active compound according to claim 6,  
wherein  $A^1$  and  $A^2$  each independently represents a 1,4-phenylene  
25 group or a 1,4-cyclohexylene group, and  $E^1$  represents  $-CH_2-$  or

-COO-.

9. The optically active compound according to claim 4,  
wherein n represents 1, m represents 2, and  $Z^1$  and  $Z^2$  represent  
5 a single bond.

10. The optically active compound according to claim 9,  
wherein p represents 0, q represents 1, and  $E^1$  and  $E^2$  each  
independently represents  $-CH_2-$ ,  $-COO-$  or  $-OCO-$ .

10

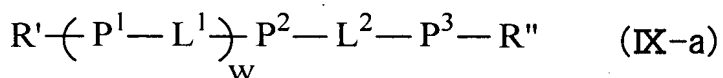
11. The optically active compound according to claim 10,  
wherein  $A^1$ ,  $A^2$  and  $A^3$  each independently represents a 1,4-  
phenylene group or a 1,4-cyclohexylene group.

15 12. The optically active compound according to claim 2,  
wherein  $Y^1$  represents a fluorine atom, a methyl group, a  
methoxy group, a trifluoromethyl group or a trifluoromethoxy  
group.

20 13. A nematic or cholesteric liquid crystal composition  
comprising 0.01% by weight to 50% by weight of the optically  
active compound of claim 2.

14. The nematic or cholesteric liquid crystal composition  
25 according to claim 13, comprising a cholesterol derivative or

one to five kinds of optically active compounds represented by the general formula (IX-a):



wherein R' and R'' each independently represents an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, a hydrogen atom, a fluorine atom, a chlorine atom, a bromine atom, an iodine atom, a cyano group or an isothiocyanate group, the alkyl group or the alkenyl group is not substituted or can have one, two or more fluorine atoms, chlorine atoms, cyano groups, methyl groups or trifluoromethyl groups as a substituent, and one, or two or more methylene groups existing in the alkyl group or the alkenyl group may be substituted with -CO- or may be substituted with an oxygen atom or -COO- in such a manner that oxygen atoms are not directly bonded to each other,

P<sup>1</sup>, P<sup>2</sup> and P<sup>3</sup> each independently represents a 1,4-phenylene group, a 1,4-cyclohexylene group, a 1,4-cyclohexenyl group, a tetrahydropyran-2,5-diyl group, a 1,3-dioxane-2,5-diyl group, a tetrahydrothiopyran-2,5-diyl group, a 1,4-bicyclo(2,2,2)octylene group, a decahydronaphthalene-2,6-diyl group, a pyridine-2,5-diyl group, a pyrimidine-2,5-diyl group, a pyrazine-2,5-diyl group, a 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, a 2,6-naphthylene group, an indane-2,5-diyl group, a phenanthrene-2,7-diyl group, a 9,10-dihydrophenanthrene-2,7-diyl group, a 1,2,3,4,4a,9,10a-

octahydrophenanthrene-2,7-diyl group or a fluorene-2,7-diyl group, and the 1,4-phenylene group, the 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, the 2,6-naphthylene group, the phenanthrene-2,7-diyl group, the 9,10-dihydrophenanthrene-2,7-diyl group, the 1,2,3,4,4a,9,10a-octahydrophenanthrene-2,7-diyl group and the fluorene-2,7-diyl group are not substituted or can have one, or two or more fluorine atoms, chlorine atoms, trifluoromethyl groups, trifluoromethoxy groups or methyl groups as a substituent,

10  $L^1$  and  $L^2$  represent a single bond,  $-COO-$ ,  $-OCO-$ ,  $-C\equiv C-$  or an alkylene group having 2 to 5 carbon atoms in which one, or two or more methylene groups existing in the group may be substituted with  $-CO-$  or may be substituted with an oxygen atom or  $-COO-$  in such a manner that oxygen atoms are not  
15 directly bonded to each other, and the alkylene group is not substituted or may have one, or two or more fluorine atoms, alkyl groups having 1 to 5 carbon atoms, trifluoromethyl groups, trifluoromethoxy groups or phenyl groups as a substituent,

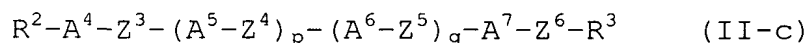
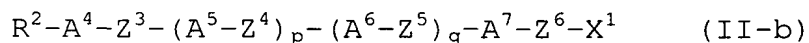
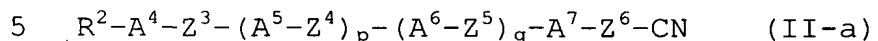
20  $w$  is 0, 1 or 2, and when  $w$  is 2, the two groups  $P^1$  or the two groups  $L^1$  may be the same or different, and

at least one of  $R'$ ,  $R''$ ,  $L^1$  and  $L^2$  is an optically active group,

wherein a natural pitch at 25°C is from 0.1 to 1000  $\mu m$ .



15. The nematic or cholesteric liquid crystal composition according to claim 13, comprising one, or two or more kinds of compounds selected from the group consisting of compounds represented by the general formulas (II-a), (II-b) and (II-c):



wherein  $R^2$  and  $R^3$  each independently represents an alkyl group having 1 to 10 carbon atoms or an alkenyl group having 2 to 10 carbon atoms, the alkyl group or the alkenyl group is not substituted or can have one, or two or more fluorine atoms, chlorine atoms, cyano groups, methyl groups or trifluoromethyl groups as a substituent, and one, or two or more methylene groups existing in the alkyl group or the alkenyl group may be substituted with -CO- or may be substituted with an oxygen atom or -COO- in such a manner that oxygen atoms are not directly bonded to each other,

$A^4$ ,  $A^5$ ,  $A^6$  and  $A^7$  each independently represents a 1,4-phenylene group, a 1,4-cyclohexylene group, a 1,4-cyclohexenyl group, a tetrahydropyran-2,5-diyl group, a 1,3-dioxane-2,5-diyl group, a tetrahydrothiopyran-2,5-diyl group, a 1,4-bicyclo(2,2,2)octylene group, a decahydronaphthalene-2,6-diyl group, a pyridine-2,5-diyl group, a pyrimidine-2,5-diyl group, a pyrazine-2,5-diyl group, a 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, a 2,6-naphthylene group, an indane-2,5-diyl

group, a phenanthrene-2,7-diyl group, a 9,10-dihydrophenanthrene-2,7-diyl group, a 1,2,3,4,4a,9,10a-octahydrophenanthrene-2,7-diyl group or a fluorene-2,7-diyl group, and the 1,4-phenylene group, the 1,2,3,4-

5 tetrahydronaphthalene-2,6-diyl group, the 2,6-naphthylene group, the phenanthrene-2,7-diyl group, the 9,10-

dihydrophenanthrene-2,7-diyl group, the 1,2,3,4,4a,9,10a-octahydrophenanthrene-2,7-diyl group and the fluorene-2,7-diyl

group are not substituted or can have one, or two or more

10 fluorine atoms, chlorine atoms, trifluoromethyl groups,

trifluoromethoxy groups or methyl groups as a substituent,

$Z^3$ ,  $Z^4$ ,  $Z^5$  and  $Z^6$  each independently represents a single

bond,  $-CO-$ ,  $-COO-$ ,  $-OCO-$ ,  $-CH=N-$ ,  $-N=CH-$ ,  $-C\equiv C-$ ,  $-CH_2CH_2-$ ,

$-CH_2CH_2CH_2-$ ,  $-CH_2CH_2CH_2CH_2-$ ,  $-CH_2O-$ ,  $-OCH_2-$ ,  $-CF_2O-$ ,  $-OCF_2-$ ,

15  $-CH=N-N=CH-$ ,  $-CF=CF-$ ,  $-CH=CH-$ ,  $-CH_2CH_2CH=CH-$ ,  $-CH=CHCH_2CH_2-$  or

$-CH_2CH=CHCH_2-$ ,

$X^1$  represents a fluorine atom, a chlorine atom, a

trifluoromethyl group, a trifluoromethoxy group, a

difluoromethoxy group or an isothiocyanate group, and

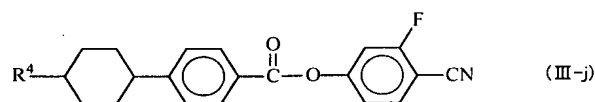
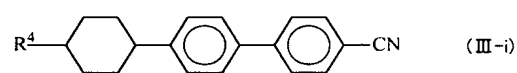
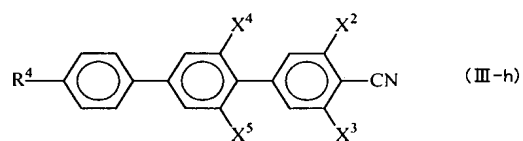
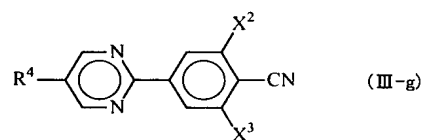
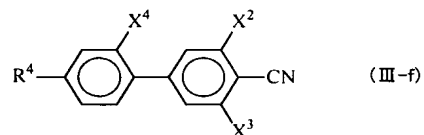
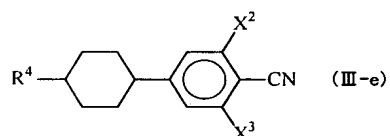
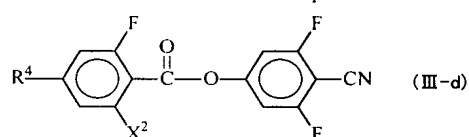
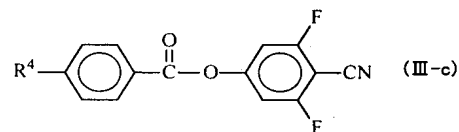
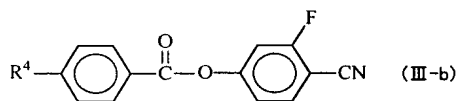
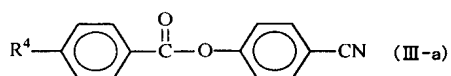
20 p and q each independently represents 0 or 1.

16. The nematic or cholesteric liquid crystal composition

according to claim 15, comprising compounds selected from the

group consisting of compounds represented by the general

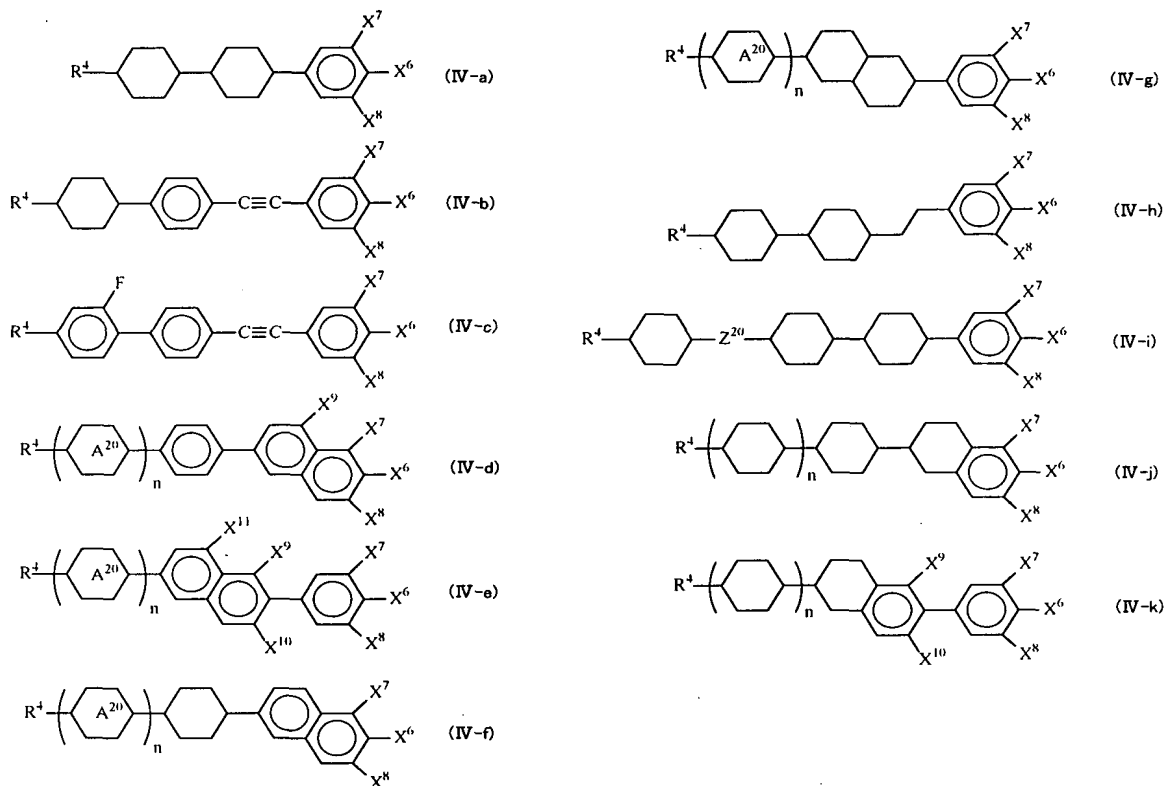
25 formulas (III-a) to (III-j):



wherein  $R^4$  represents an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms or an alkenyloxy group having 2 to 10 carbon atoms, and

$X^2$ ,  $X^3$ ,  $X^4$  and  $X^5$  each independently represents a hydrogen atom, a fluorine atom or a chlorine atom.

17. The nematic or cholesteric liquid crystal composition according to claim 15, comprising compounds selected from the group consisting of compounds represented by the general formulas (IV-a) to (IV-k):



wherein  $R^4$  represents an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms or an alkenyloxy group having 2 to 10 carbon atoms,

$A^{20}$  represents a 1,4-phenylene group or a 1,4-cyclohexylene group,

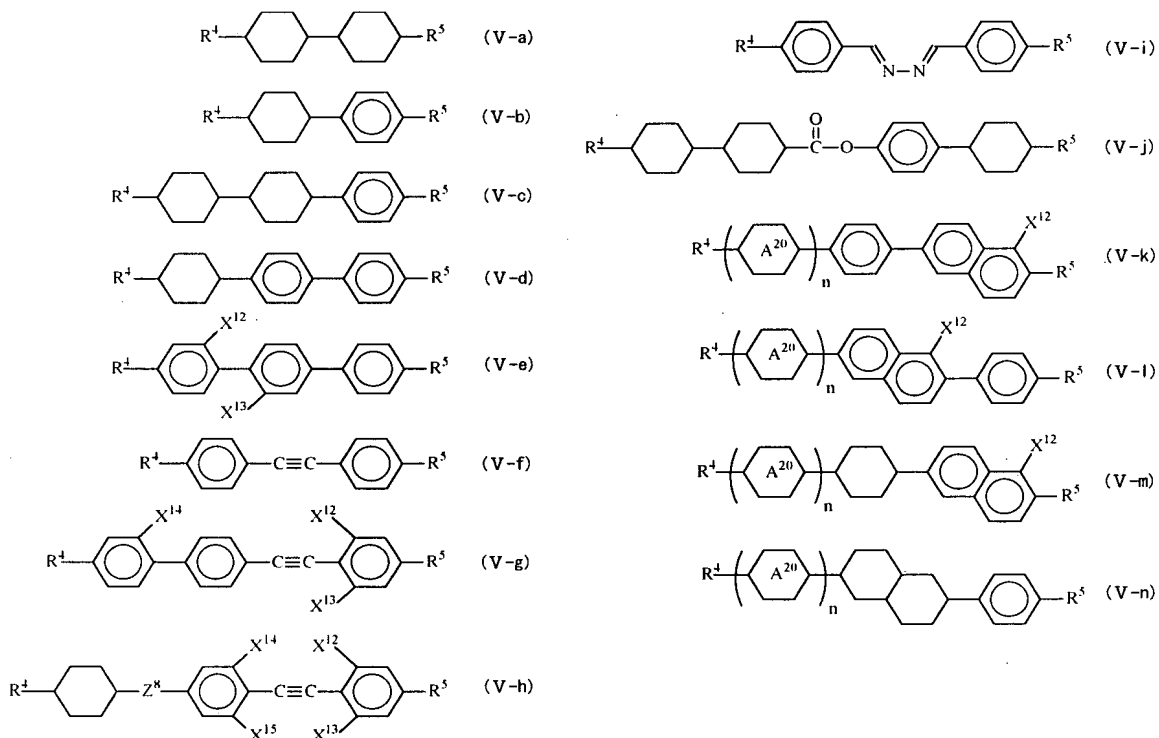
$Z^{20}$  represents a single bond or  $-\text{CH}_2-\text{CH}_2-$ ,

$X^6$  represents a fluorine atom, a chlorine atom, a difluoromethoxy group or a trifluoromethoxy group, and

$X^7$  to  $X^{11}$  each independently represents a hydrogen atom, a fluorine atom or a chlorine atom.

18. The nematic or cholesteric liquid crystal composition

according to claim 15, comprising compounds selected from the group consisting of compounds represented by the general formulas (V-a) to (V-n):



5 wherein  $R^4$  and  $R^5$  each independently represents an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms or an alkenyloxy group having 2 to 10 carbon atoms,

10  $A^{20}$  represents a 1,4-phenylene group or a 1,4-cyclohexylene group,

$Z^8$  represents a single bond,  $-CH_2-CH_2-$  or  $-COO-$ , and

$X^{12}$  to  $X^{15}$  each independently represents a hydrogen atom, a fluorine atom or a methyl group.

15 19. A liquid crystal display device using the liquid crystal

composition of claim 13.

20. A TN or STN liquid crystal display device using the liquid crystal composition of claim 16 or 18.

5

21. An active driving liquid crystal display device using the liquid crystal composition of claim 17 or 18.

22. A cholesteric liquid crystal display device using the  
10 liquid crystal composition of claim 16 or 18.